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EXAMINER

CHEN, XIAOLIANG

ART UNIT

PAPER NUMBER

2841

MAIL DATE

DELIVERY MODE

10/15/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/517,948

Applicant(s)

HEISE ET AL.

Examiner

Xiaoliang Chen

Art Unit

2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Amendment

1. Acknowledgement is made of Amendment filed 09-17-2007.
2. Claims 11, 16 and 20 are amended.
3. Since claim 16 is amended, the objection for claim 16 has been withdrawn.
4. The amended Claim 11 has a new matter, which had not been disclosed in the original claims or in the specification.

Claim Objections

5. Claims 11 and 20 are objected.

Claim 11 has been amended to replace the word "comprising" with "consisting", there is no base for such change. There is no statement about "a fuse bridge consisting a basic material, the melting point which is lower than the melting point of the material of which the a trip conductors are made". Also see the "Response to Arguments" below.

For examining purpose, the word read as "comprising".

Response to Arguments

6. Response to the Arguments filed on 09-17-2007.
7. For rejections under 35 U.S.C.102(b):

Applicant arguments, for independent claim 11:

"Claim 11 has been amended to replace the word "comprising" with "consisting of." As shown in Fig. 1 and the description on page 7, second paragraph (starting at line 4), the conductors 2 are furnished with gaps which are bridged with lower-melting material. Thus the bridge consists of the lower-melting material, while in Krueger the lower-melting material 138 is only applied on top of the bridge, which is made of piece 135 (see Figs. 3G and 3H) as one piece including the terminals 125 and 130. The material of the pieces 135, of with the bridge is cut, is copper (Column 5, lines 8-12). The lower-melting material of the smaller piece, even if exposed to high temperatures, will not break the bridge since the bridge is made of copper. The fuse shown in Krueger et al. will only react to high currents and will not break due to temperature due to the copper material."

The amendment of "Claim 11 has been amended to replace the word "comprising" with "consisting of" has no base according to the original claims and the specification.

In the specification: Page 2, Line 4, said fuse bridge containing or being made of a basic material, the melting point of which is lower than the melting point of the material of which the strip conductors are made.

"containing" is as same as "comprising", and "being made of" is "comprising", for example: the pencil is made of lead, (the pencil still can have other material, such as wood and rubber), it is still different from "consisting of".

Even the applicant is admitted that the fuse is "comprising" other materials:

In the specification: Page 4, line 28, "Particularly favorable electric conductivities of the fuse bridge and in particular an especially favorable solderability by using conventional soldering materials can be achieved by advantageously coating the basic material for manufacturing the fuse bridge with a layer, in particular made of tin, tin alloy, gold, or passivated copper."

In the specification: Page 8, line 8, "the basic material of the respective fuse bridge 6 is coated with a layer furthering the solderability, in particular made of tin, tin alloy, gold, or passivated copper."

So, it is clear that the fuse bridge "comprising" not only the basic material (conventional soldering material) but also a layer of tin, tin alloy or copper. (as same as in the Reference, about which applicant arguing).

According to the temperature demand of the fuse, of course the thickness of copper layer could be chosen to comply with the demand.

The argument is not persuasive and the rejections under 35 U.S.C.102(b) stand.

For rejections under 35 U.S.C.103(a): No other argument besides the dependent of the claims.

Therefore the rejections under 35 U.S.C.103(a) stand.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 11-15 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Krueger et al. (US6043966).

Re claim 11, Krueger et al. clearly show and disclose

A printed circuit board (15, fig. 1) comprising strip conductors (25, fig. 1) for electronic circuits and connections (a printed circuit board having a plurality of conductive traces deposited on a surface [ABSTRACT]) for a voltage supply unit (an electrical assembly 10 [col. 3, line 34], fig. 1, a voltage supply or power supply is very a common unit, and an electrical assembly inherently could be or could be connected for a voltage supply) being equipped with at least one SMD-component (surface-mounted, electronic components [col. 1, line 32]) and additional parts (additional electrical components [col. 3, line 23]) that are soldered in a suitable manner (fig. 1), said voltage supply unit being connected to at least one supplying strip conductor (conductive layer 135 is deposited on the substrate 87 connecting the first and second circuit traces 125,130 [col. 4, line 32]), wherein at least one of the supplying strip conductors includes a break (138, fig. 4E) which is bridged in a conductive manner (fig. 3I) by means of a fuse bridge (139, fig. 4E), said fuse bridge comprising a basic material (tin or a tin/lead alloy is applied to the thin fusible elements 136 forming fusible links 139 [col.4, line 64]), the melting point of which is lower than the melting point of the material of which the strip conductors are made (circuit traces 125,130 are typically a

copper foil [col. 5, line 10], the melting point of tin or a tin/lead alloy is lower than the melting point of copper).

Re claim 12, Krueger et al. clearly show and disclose

The printed circuit board as claimed in claim 11, wherein the melting point of the basic material is at least as high as the melting point of the solder (the melting point of tin or a tin/lead alloy is higher than the melting point of solder) used for placement of the printed circuit board.

Re claim 13, Krueger et al. clearly show and disclose

The printed circuit board as claimed in claim 11, wherein the fuse bridge fully consists of metallic material (tin or a tin/lead alloy is applied to the thin fusible elements 136 forming fusible links 139 [col.4, line 64]).

Re claim 14, Krueger et al. clearly show and disclose

The printed circuit board as claimed in claim 13, wherein the metallic material comprises tin or any tin alloy (tin or a tin/lead alloy is applied to the thin fusible elements 136 forming fusible links 139 [col.4, line 64]).

Re claim 15, Krueger et al. clearly show and disclose

The printed circuit board as claimed in claim 11, wherein the fuse bridge is connected to material of the strip conductor in a conductive fashion by means of the solder used in the soldering process (These discrete surfaced-mounted electronic components are typically soldered or electrically connected to the conductive traces [col. 1, line 34]).

Re claim 18, Krueger et al. clearly show and disclose

The printed circuit board as claimed in claim 11, wherein the basic material for manufacturing the fuse bridge is coated with a layer (a second conductive layer is applied to the first conductive layer to form a fusible link [col. 2, line 19]) made of a material out of the group consisting of tin (tin [col.4, line 64]), any tin alloy (tin/lead alloy [col.4, line 64]), gold and passivated copper (electroless plated copper [col. 5, line 23]).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 16-17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krueger et al. (US6043966), and in view of Montgomery et al. (US6034589).

Re claim 16, Krueger et al. clearly show and disclose

The printed circuit board as claimed in claim 11,
except for the fuse bridge being shaped in such a way that it can be fed to a conventional pick-and-place machine in a taped and magazined fashion.

In the same field of wiring board with fuse, Montgomery et al. teaches the following:

wherein the fuse bridge is shaped in such a way that it can be fed to a conventional pick-and-place machine (the use of surface mount components

generally lowers manufacturing costs by allowing the use of highly automated assembly equipment [col. 1, line 20]) in a taped and magazined fashion (taped and magazined is a well known package in the art of surface mount components and a common fashion for the surface mount components used in the highly automated assembly equipment).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the fuse bridge of Krueger et al. with the same shape as taught by Montgomery et al., since Montgomery et al. states in [col. 1, line 20], "the use of surface mount components generally lowers manufacturing costs by allowing the use of highly automated assembly equipment. The shift from leaded components to surface mount components by the electronics industry has resulted in greater demands for smaller, higher reliability, less costly surface mount fuses with greater amperage and voltage ratings."

Re claim 17, Krueger et al. clearly show and disclose

The printed circuit board as claimed in claim 11,
except for the fuse bridge being manufactured by severing from a wire (fusible elements may comprise wires [col. 5, line 44]) or a sheet-metal strip.

In the same field of wiring board with fuse, Montgomery et al. teaches the following:

wherein the fuse bridge is manufactured by severing from a wire (fusible elements may comprise wires [col. 5, line 44]) or a sheet-metal strip.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the fuse bridge of Krueger et al. with the wire as taught by Montgomery et al., since Montgomery et al. states in [col. 1, line 25], "in great demands for smaller, higher reliability, less costly surface mount fuses with greater amperage and voltage ratings."

Re claim 20, Krueger et al. clearly show and disclose

A method of manufacturing a printed circuit board (15, fig. 1) comprising strip conductors (25, fig. 1) for electronic circuits and connections (a printed circuit board having a plurality of conductive traces deposited on a surface [ABSTRACT]) for a voltage supply unit (an electrical assembly 10 [col. 3, line 34], fig. 1, a voltage supply or power supply is very a common unit, and an electrical assembly inherently could be or could be connected for a voltage supply) being equipped with at least one SMD-component (surface-mounted, electronic components [col. 1, line 32]) and additional electronic and/or electromechanical parts that (additional electrical components [col. 3, line 23]) are soldered in a suitable manner (fig. 1), said voltage supply unit being connected to at least one supplying strip conductor (conductive layer 135 is deposited on the substrate 87 connecting the first and second circuit traces 125,130 [col. 4, line 32]), wherein at least one of the supplying strip conductors includes a break (138, fig. 4E) which is bridged in a conductive manner (fig. 3I) by means of a fuse bridge (139, fig. 4E), said fuse bridge comprising a basic material (tin or a tin/lead alloy is applied to the thin fusible elements 136 forming fusible links 139 [col.4, line 64]), the

melting point of which is lower than the melting point of the material of which the strip conductors are made (circuit traces 125,130 are typically a copper foil [col. 5, line 10], the melting point of tin or a tin/lead alloy is lower than the melting point of copper),

except for the method comprising the step of manufacturing the fuse bridge immediately prior to placement of the printed circuit board.

In the same field of wiring board with fuse, Montgomery et al. teaches the following:

the method comprising the step of manufacturing the fuse bridge immediately prior to placement of the printed circuit board (because a surface mount chip fuse 10 [col. 4, line 67], which is solder to a printed circuit board, it could be manufactured before mounting to the printed circuit board).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the step of manufacturing the fuse bridge of Krueger et al. by immediately prior to placement of the printed circuit board as taught by Montgomery et al., since Montgomery et al. states in [col. 5, line 48], "to provide a surface mount chip fuse with improved soldering heat and chemical resistance, and to provide a surface mount chip fuse which can be easily manufactured at low cost."

9. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krueger et al. (US6043966), and in view of Peter (US6314789).

Re claim 19, Krueger et al. clearly show and disclose

The printed circuit board as claimed in claim 11,
except for adjacent supplying strip conductors being separated from each other by recesses.

In the same field of heat sensor (the fuse bridge in the instant claim is acting as a heat sensor), Peter teaches the following:

wherein adjacent supplying strip conductors are separated from each other by recesses (cutout 20 [col. 3, line 19], fig. 1)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to separate the strip conductors of Krueger et al. with the cutout as taught by Peter, since Peter states in [col. 1, line 50], "The heat barrier prevents thermal "cross-talk" between the support elements, so that the first heat source cooperates only with the first sensor element, and the second heat source cooperates only with the second sensor element, i.e., the heat barrier creates a thermal isolation between the two sensor elements and between respective sensor element and the heat source not assigned to that sensor element."

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiaoliang Chen whose telephone number is 571-272-9079. The examiner can normally be reached on 7:00-5:00 (EST), Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on 571-272-2800, ext 31. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2841

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



TUAN T. DINH
PRIMARY EXAMINER

10/05/07

Xiaoliang Chen *X^e*
Examiner
Art Unit 2841